HP 250

HP 45120A Interface Installation and Reference

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HP 45120A Interface Installation and Reference

Manual Part No. 45120-90060

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Definitions

WARNING: Calls your attention to a procedure or operation which, if not strictly followed, could result in personal injury.

CAUTION: Calls your attention to a procedure or operation which, if not followed, could result in damage to equipment.

NOTE: Calls your attention to information that requires your special attention.

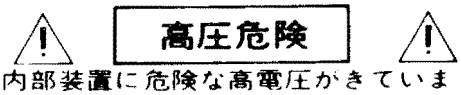
Hazardous voltages are present inside equipment. The procedures contained in this section shall be performed only by qualified service personnel.

Innerhalb des Geräts bestehen gefährliche Spannungen. Die in diesem Abschnitt enthaltenen Arbeiten dürfen nur durch Betriebsfachpersonal durchgeführt werden.

Des tensions dangereuses sont présentes à l'intérieur du matériel. Les opérations décrites dans cette section ne devront être effectuées que par un personnel qualifié.

Pericolo: Alta tensione presente in questa apparecchiatura. Le procedure contenute in questa sezione debbono essere effettuate soltanto da qualificato personale di servizio.

Hay voltaje peligroso en el interior de este equipo. Los procedimientos expuestos en esta sección sólo deberá llevarlos a cabo el personal de servicio calificado.



内部装置に危険な高電圧がきています　この章にある処置や手続に関しては、専門のサービスマンによってのみ行なって下さい

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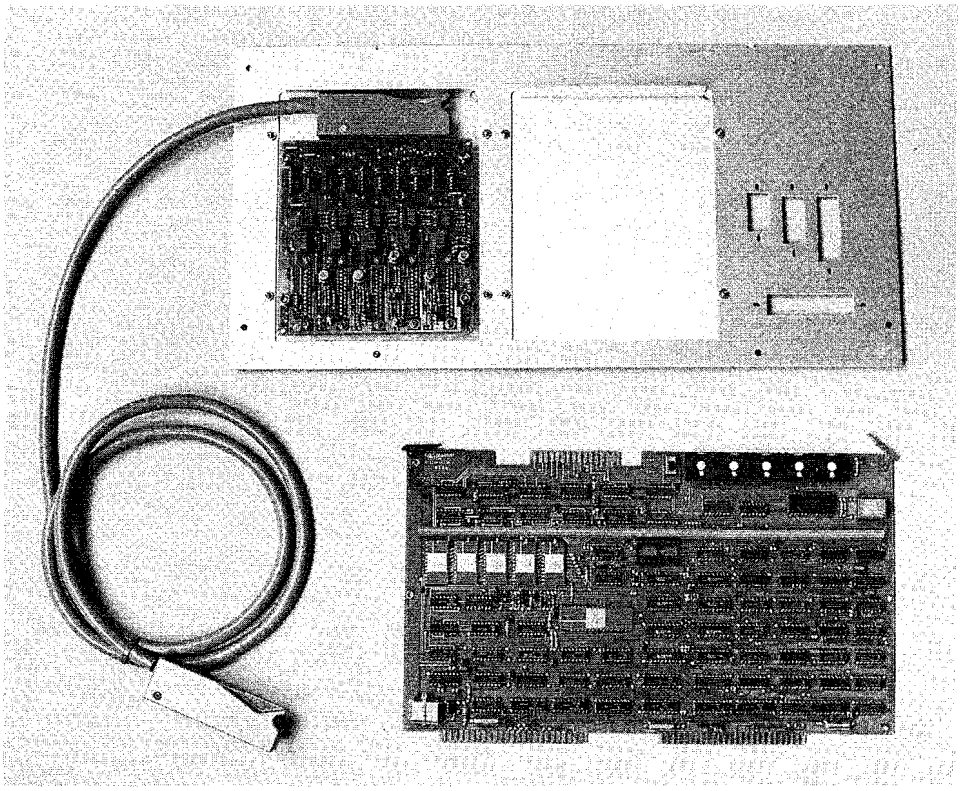
CHAPTER 1

Interface Installation

Introduction

The HP45120A Asynchronous Data Comm Interface is a microprocessor-controlled interface between the HP 250 and up to five remote devices. Any combination of Remote/250 consoles, terminals, printers, and computers is permitted. Connections are made via RS-232C/V24 , 20mA current-loop, and/or modem.

The 45120A consists of the Asynchronous Data Comm Board (45120-66550) which plugs into the HP 250 card cage, the RS-232C Connector Board (45120-66551) which mounts on the HP 250 rear panel, and an interconnecting cable (45120-61600). Each port on the connector board can be configured to run at any of nine speeds from 110 thru 9600 baud. The rate is selected with a 10-position baud-rate switch for each port. Each port must also be configured, via jumpers, for the type of connection desired.



45120A Asynchronous Data Comm Interface

Equipment Supplied

The following items are packaged with each 45120A.

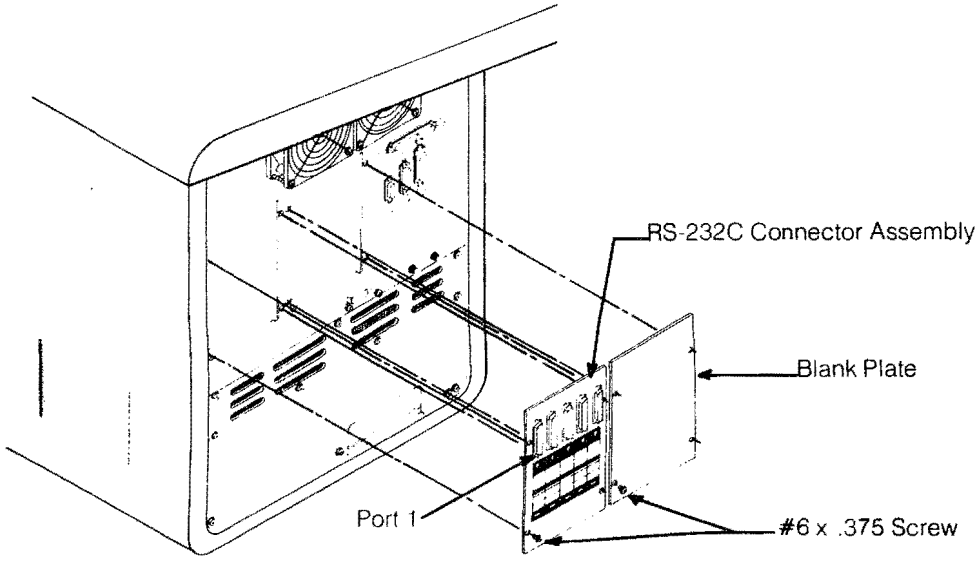
Description	Qty	Part Number
Asynchronous Data Communication Board	1	45120-66550
RS-232C Connector Board	1	45120-66551
Interconnection Cable	1	45120-61600
Cover Panel	1*	45120-00214
Blank Plate	1*	45120-00211
Operating System Software	2	45251-13000
TIO Programming Manual	1	45120-90001
Remote Programming Manual	1	45120-90020
Installation & Reference Manual	1	45120-90060

* Not provided with 45120 Option 097.

Installation Procedure

Refer to the next figure while installing the 45120A.

1. Switch the HP250 off and disconnect the power plugs.
2. Remove both interface cover plates from the back panel (see figure).
3. Locate the jumpers on the RS-232C connector board and set the jumpers as indicated for each port (see page 1-6).
4. Connect the board interconnection cable to the RS-232C board as shown on page 1-6.
5. Mount the interface board assembly on the back panel using four locking screws.
6. Route the board interconnection cable along the wire bundle to the card cage and secure it with the re-usable cable ties.



Mounting the RS-232C Connector Assembly

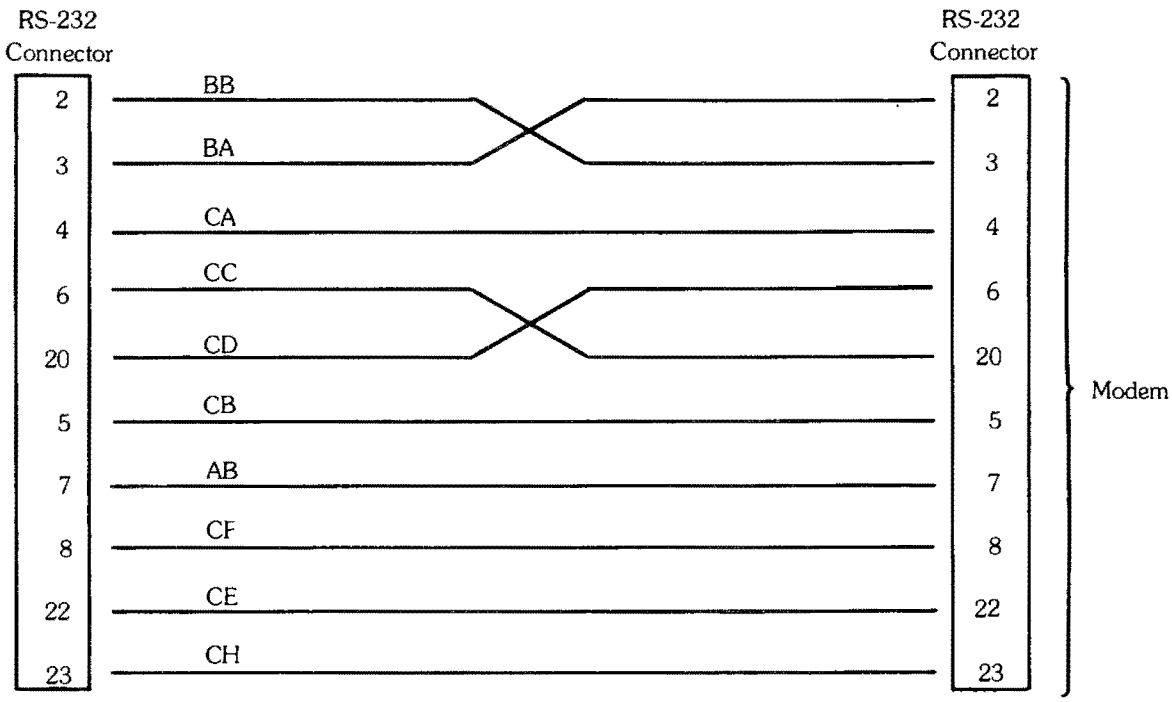
7. Check that all the asynchronous data comm board jumpers are in the "A" position. Plug the board into the right side of the card cage. See the HP 250 On-Site Service Manual (45251-90030) for card cage configuration information.
8. Connect the board interconnection cable to the asynchronous data comm board.
9. Set the baud-rate switches as required for each port. See page 1-5.
10. Set the peripheral address switch to PA5. This will ensure that the left-most port is port 1 and the right-most port is port 5.
11. Insert an operating system (SYSTEM) disc in a drive, close the door and switch the HP 250 on. Wait 30 seconds for warm-up and system loading.
12. Run the CONFIG program to reconfigure system discs and memory:
    - Select DROM EDIT and configure the TIO (and TIO) DROMS.
    - Select REMOTE CONFIGURATION and set the device address, class type, etc., for each port.
13. Verify interface operation by running the appropriate procedure at the end of this chapter.

Interface Cable Requirements

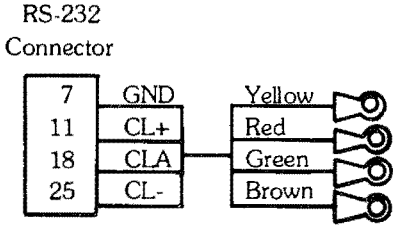
		Cable/Option Requirements	
Device	**Type Connection**	**HP 250**	**Device**
TTY Compatible RS-232C I/O	Modem	45111A	Customer Supplied
	Direct	45113A*	Customer Supplied
HP264X Series Terminals	Modem	45111A 13232M (EUR)	13232A (US/EUR) 13232N (US)
	Current+	45112A	13232F
	Direct	45113A*	13232A (US/EUR) 13232M (EUR) 13232N (US)
HP 262X Series Terminals	Modem	45111A	13222M (EUR) 13222N (US)
	Direct	45113*	13222M (EUR) 13222N (US)
HP 2635 Keyboard/Printer and HP 2631 Printer	Modem	45111A	Option 41
	Direct	45113A*	Option 41
HP 3000 Computer	Modem	45111A	03000-30062B
	Direct	45111A	45113A

* The 45113A cable is optional and is used for greater distance (10.5 metres).

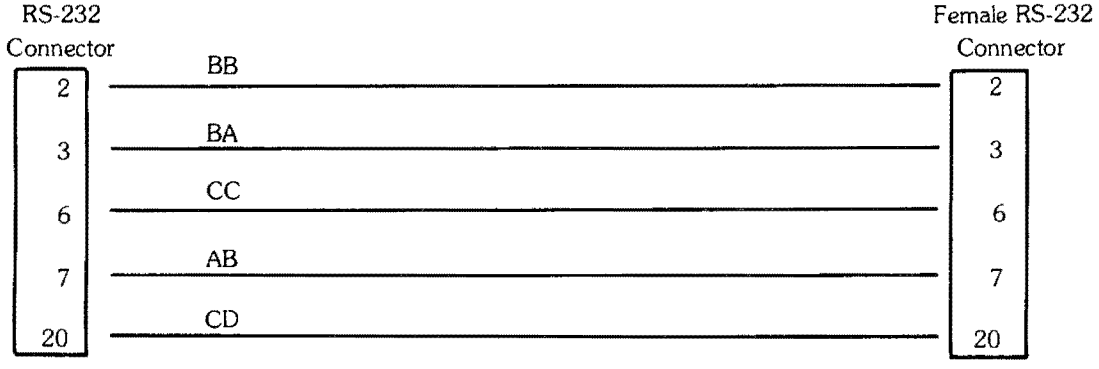
+ The 13260B, Extended Asynchronous Interface, is required for current loop connections to 264X series terminals.



45111A Modem Cable



45112A Current Loop Cable

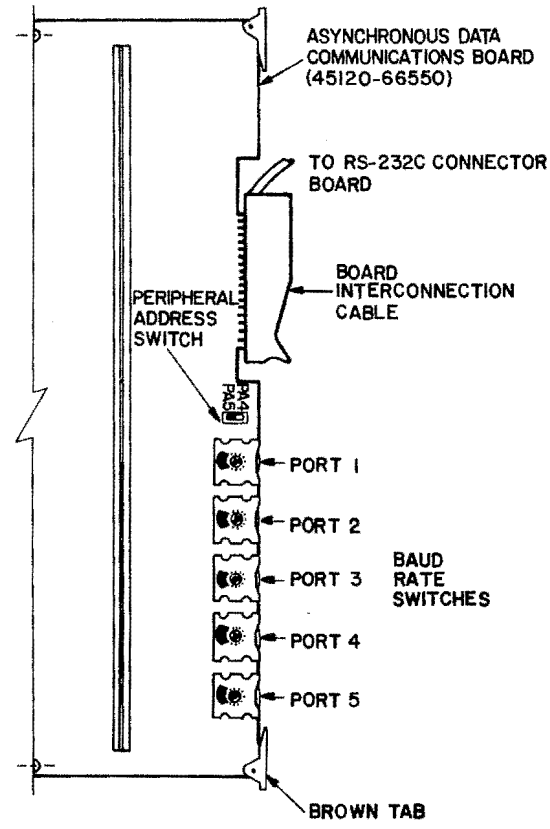


45113A Direct Connect Cable

Baud-rate Switch Settings

The baud-rate switches are located on the Asynchronous Data Communications Board, as shown below. Each switch must be set to match the baud rate for the device connected to the corresponding port.

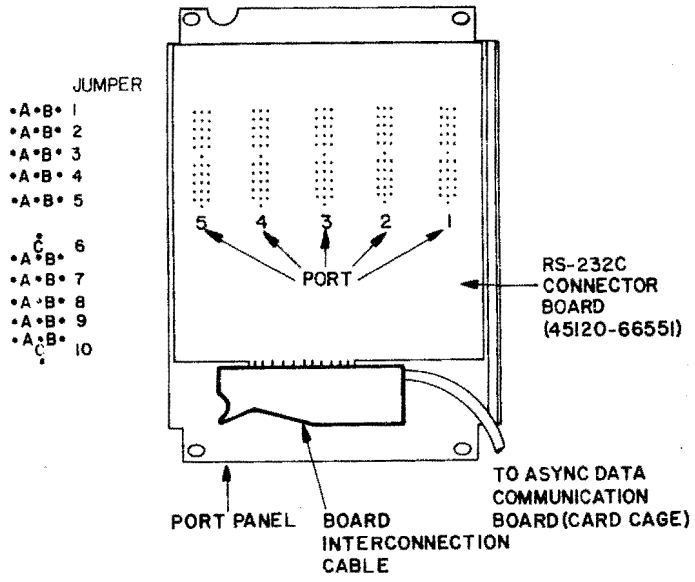
Switch Setting	Baud Rate
0	110
1	200
2	300
3	600
4	1200
5	1800
6	2400
7	4800
8	9600
9	Not used



Asynchronous Data Communications Board
(45120-66550)

Connector Board Jumpers

The connector board must be jumpered to accommodate each port assignment.



RS-232C Connector Board Assembly (rear view)

Jumper Configurations

Jumper	Direct Connection		Modem Connection	
	RS-232C	Current Loop	Leased Lines	Switched Lines
1	A	B	A	A
2	A	B	A	A
3	A	B	A	A
4	A	B	A	A
5	A	B	A	A
6	A	A	A/B/C(2)	A
7	A	A	B	B
8	A	A	A	B
9	A/B(1)	A	B	B
10	A	A	C	B/C(3)

Notes:

1 A – if DTR is not provided by the remote device.
B – if DTR is provided by the remote device.

2 sets desired data rate select (function of the modem used).

3 B – monitor CTS (US).
C – monitor DCD (EUR).

Jumper Definitions

Jumper	Definitions
1-5	A RS-232C B 20mA current loop
6	A DRS not used B DRS wired to +12V C DRS wired to −12V
7	A RTS not used B RTS wired to +12V thru 2.7K pull-up
8	A DSR (DTR for modem) wired to +12V thru 2.7K pull-up B DSR (DTR for modem) controlled by UART
9	A DTR (DSR for modem) wired to +12V tru 2.7K pull-up B DTR (DSR for modem) monitored
10	A CTS and DCD not monitored: input to UART wired to +12V thru 2.7K pull-up B CTS monitored C DCD monitored

HP Terminals and Printers

When connecting an HP 264X series terminal, HP 2635 keyboard/printer, or the HP 2631 dot matrix printer directly to the HP 250, use direct connection RS-232C with all jumpers set to "A" except jumper #9. Set jumper #9 to "B".

HP 3000

Direct connection of the HP 250 to an HP 3000 requires that all jumpers be set to "A".

Operation Verification

HP Terminals

Enter and run the following program to verify each terminal port.

```
10    INPUT "ENTER DEVICE ADDRESS OF PORT UNDER TEST";P
20    REQUEST P
30 Pr: PRINTER IS P
40     PRINT "ENTER DATA AND PRESS RETURN KEY."
50     ON INPUT #P GOTO In
60     WAIT
70 In: PRINTER IS 8
80     DISP AREAD$(P)
90     WAIT 1000
100    GOTO Pr
110    END
```

This program outputs TYPE IN DATA AND PRESS RETURN KEY to the terminal. Data entered at the terminal is then transferred to the HP 250 and displayed on the CRT.

HP 2631 Printer

1. Using the System Console, select the printer port with the PRINTER IS statement.
2. Execute PRINT "TEST". The printer should print the word "TEST".
3. Repeat the test for each printer port.

HP 3000 Computer

1. Run the LK3000 program. The HP 3000 system prompt (:) should appear.
2. Log on.
3. Log off.
4. Press HALT to terminate the LK 3000 program.
5. Repeat the test for each HP 3000 port.

CHAPTER 2

Remote/250 Installation

Introduction

This chapter describes installing the HP 2649D, Remote/250 console. Also included are console specifications, options, and information on installing accessories after the original installation.

Inspection

Each part of your Remote/250 console was carefully inspected before it was shipped to you. All equipment should be free of scratches and should operate properly. Carefully inspect the console, keyboard, cables, etc., for physical damage sustained in transit. Notify Hewlett-Packard and file a claim with the carrier if there is any damage. Please check to ensure that you have received all items ordered and that any options specified on your order have been installed in your console. Decals located on the inside of the console's hinged rear-access cover show the number of any option(s) installed.

Also check to ensure that all accessories are present. See Equipment Supplied on page 2-6. If you are missing any items in your shipment or you have difficulties installing your console, contact your nearest Hewlett-Packard sales and service office for assistance.

IMPORTANT

BE SURE THAT REMOTE/250 KEYBOARD SWITCHES ARE SET CORRECTLY DURING INSTALLATION:

- PARITY - ODD
- DUPLEX - FULL
- BAUD RATE - 9600

PLEASE FOLLOW THE COMPLETE PROCEDURE IN THIS CHAPTER.

Technical Specifications

The following specifications should be considered when locating and using the Remote/250 console.

General Specifications

Screen Size: 127mm (5 inches) X 254mm (10 inches).
Screen Capacity: 24 lines X 80 columns (1920 characters).
Character Generation: 7 X 9 enhancement dot matrix; 9 X 15 dot character cell; non-interlaced raster scan.
Character Size: 2.46mm (.097 inches) X 3.175mm (.125 inches).
Character Set: upper/lower-case Roman; line drawing.
Cursor: blinking and underlining.
Display Modes: white on black, black on white (inverse video), underline, half-bright, and blinking.
Refresh Rate: 60 Hz (50 Hz optional).
Tube Phosphor: P4.
Implosion Protection: bonded implosion panel.
Memory: 8K bytes for display.
Keyboard: detachable; typewriter block, data entry pad, display editing keys, 16 special function keys, halt, resume, test, and execute keys.

Data Communications

Data Rate: 110*, 150*, 300*, 1200, 2400, or 9600 baud; switch selectable (110 selects two stop bits).
Standard Asynchronous Communications Interface: EIA Standard RS 232C/V24; fully compatible with Bell Spec. 43401 modems; compatible with most 300 baud European modems.
Extended Asynchronous Communications Interface: provides current loop and modem disconnect capabilities. (See 13260B communications data sheet for details).
Transmission Mode: full duplex, asynchronous.
Parity: odd.

Environmental

Temperature Free-Space Ambient:
Non-Operating; −40 to +75 C (−40 to +167 F).
Operating; 0 to +55C (+32 to +131 F).
Humidity: 5 to 95% (non-condensing).
Altitude: Non-Operating; sea level to 7620 metres (25,000 feet).

Operating; sea level to 4572 metres (15,000 feet).
Vibration and Shock (type tested to qualify for normal shipping and handling):
Vibration; .37mm (0.012 inches) pp, 10 to 55 Hz, 3 axis. Shock; 30g, 11ms, 1/2 sine.

Physical

Display Monitor Weight: 19.6 kg (43 pounds).
Keyboard Weight: 3.2 kg (7 pounds).
Display Monitor Dimensions: 444mmW X 457mmD X 343mmH (17.5"W X 18" D X 13.5"H).
Keyboard Dimensions: 444mmW X 216mmD X 90mmH (17.5"W X 8.5"D X 3.5"H).

Power

Input Voltages: 115 (+10%, −23%) at 50/60 Hz (+ −.2%). 230 (+10%, −23%) at 50 Hz (± .2%).
Power Consumption: 85W to 140W maximum.

* not recommended; results in compromised performance.

Remote/250 Description

The standard Remote/250 accessories and options are listed below. Options ordered at the time of the original purchase are factory-installed.

Standard Accessories

- Standard asynchronous interface (HP 13260A) provides direct and modem RS 232C/V24 connections (to execute modem disconnect from keyboard requires the extended asynchronous interface (HP 13250B).
- U.S. Keyboard.
- HP 13232N Cable.
- Remote/250 Operators Guide (English), 45120-40010.
- 45120A Installation and Reference Manual, 45120-90060.
- 60 Hz, 110 Vac operation.

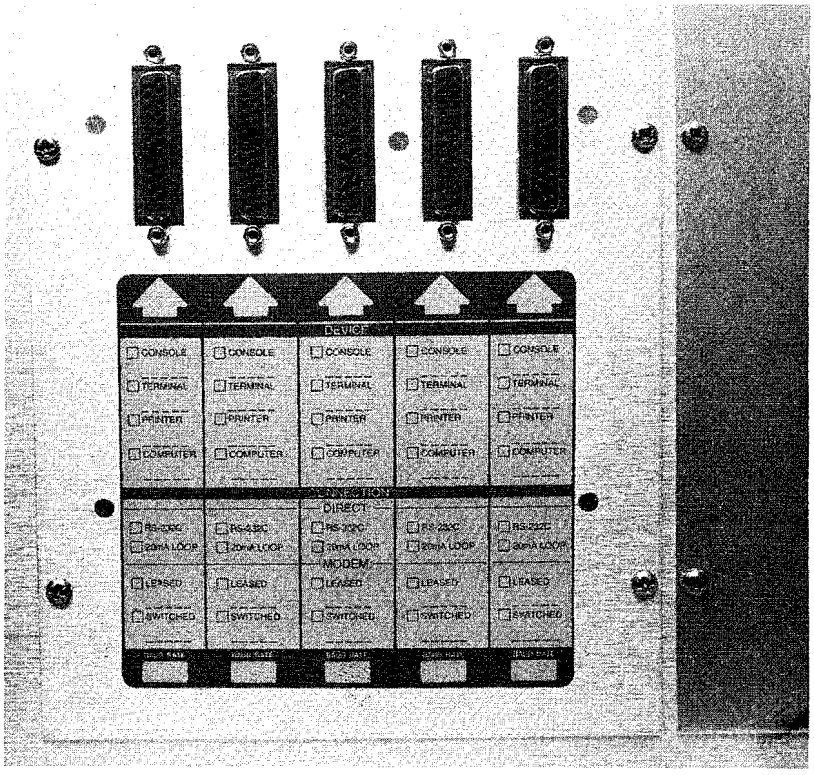
Options

Opt 252 –	French Keyboard.
Opt 253 –	German Keyboard.
Opt 254 –	British Keyboard.
Opt 255 –	Swedish Keyboard.
Opt 256 –	Spanish Keyboard.
Opt 257 –	Italian Keyboard.
Opt 258 –	Katakana Keyboard.
Opt 500 –	Danish Keyboard.
Opt 015 –	50 Hz, 220 Vac operation.
Opt 016 –	60 Hz, 110 Vac operation.
Opt 017 –	RFI specification; replaces HP 13232N Cable with HP 13232M Cable (Europe).
Opt 044 –	HP-IB Interface for printer connection to Remote/250. Includes 13296A Interface Circuit Card, HP-IB Cable (4 metres), and Printer Support ROM (1818-0768). For use with HP 2631A with option 250, or HP 9871A with option 001.
Opt 050 –	Replaces the standard asynchronous interface (HP 13260A) with the extended asynchronous interface (HP 13250B) to provide 20 mA current-loop and modem disconnect capabilities. Spade-lugs to connect with "twisted-pair" lines (26 AWG, user supplied).

Installation Procedure

Using Remote/250 consoles with the HP 250 System requires that specific options be installed on the HP 250:

- Option 120 or the HP 45120A must be installed, as covered in Chapter 1.
- 32 Kbytes (64 Kbytes optional) of user memory are required for each Remote/250 console connected to the HP 250.[1]
- RIO DROM must be auto loaded as part of the operating system version 2.D or above.



Option 120/HP 45120A

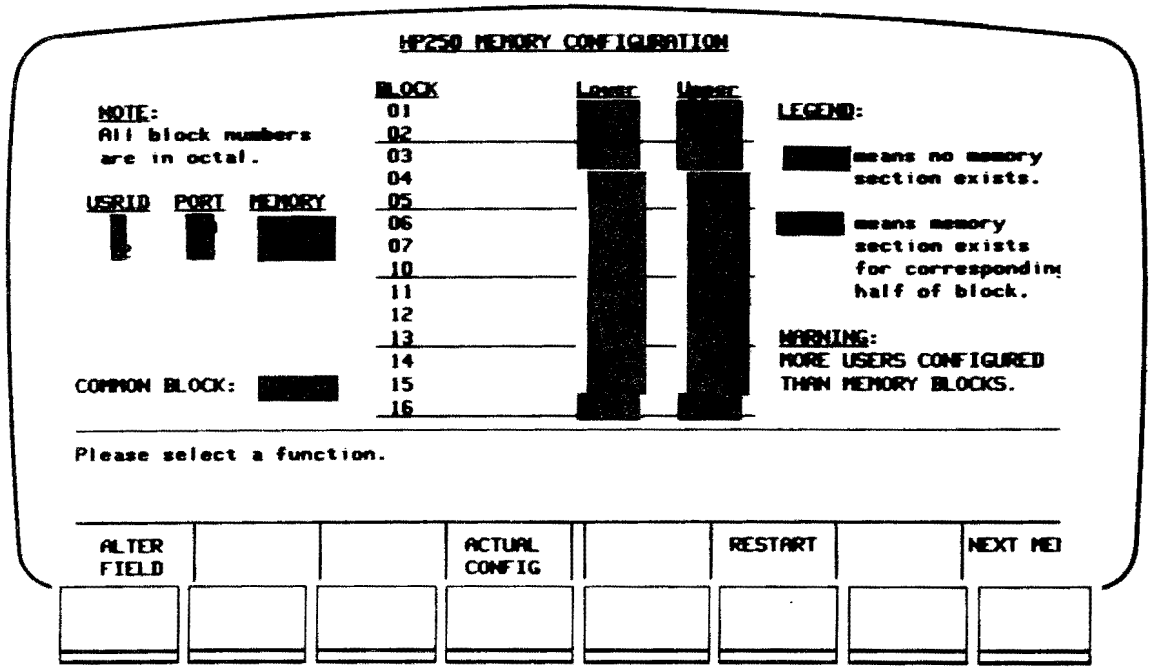
NOTE

When using Remote/250 consoles with the HP 250, the following memory is required:

- 160 Kbytes minimum for operating system.
- 32 Kbytes minimum for system console.
- 32 Kbytes minimum for each Remote/250 console.

[1] 64 Kbytes of memory are considered to be one memory block. This is the maximum user memory for the main console and each Remote/250 console. This can be subdivided into two half-blocks (1 upper and 1 lower) each having 32 Kbytes of memory. This represents the smallest division of user memory.

To check that the required memory for consoles is available, run the HP 250 CONFIG program and select the memory configuration routine. There must be 3 upper and 2 lower memory blocks for the Operating System, and at least 32 Kbytes (1 upper or lower block) required for the Main Console. If any other upper or lower blocks of memory are available, they can be used for Remote/250 consoles.[2] A minimum of 32 Kbytes (1 upper or lower block) is required for each console. See the next figure.



Memory Configuration

If any of these requirements are not satisfied or you are not sure as to their availability, call your nearest Hewlett-Packard sales and service office for assistance.

[2] This procedure assumes that the memory configuration table of the CONFIG program matches the actual memory board configuration inside the HP 250.

Equipment Supplied

The following items are packaged with each Remote/250 console as standard equipment. Also listed are the available options along with a list of equipment supplied with each option.

Description	Qty	HP Part Number
Standard Equipment:		
Installation & Reference Mnl	1	45120-90060
Operators Guide	1	45120-90010
HP 13260A Standard Async Interface	1	02645-60086
HP 13232N Modem Cable	1	
Test Connector Assembly	1	02645-60002
Option 017:		
HP 13232N Modem Cable	−1	
HP 13232M Modem Cable	1	
Option 044:		
HP 13296A Printer Interface	1	02640-60128
HP-IB Cable (4 metres)	1	8120-1834
Printer Support ROM	1	1818-0768
Load Box	1	02640-60215
IC Extractor	1	8710-0585
Option 050:		
HP 13260A Standard Async Interface Board	−1	02640-60086
HP 13250B Extended Async Interface	1	
HP 13232N Modem Cable	1	
HP 13232F Current-Loop Cable	1	
Test Connector Assembly (RS 232C/V24)	1	02645-60002
Test Connector Assembly (20 mA Current Loop)	1	02645-60035

Line Voltages and Fuses

The line voltage selection and appropriate fuses are factory installed to match the power requirements of your area. To check the line voltage requirements of your console, see the Power Unit decal located behind the console's hinged rear access cover.

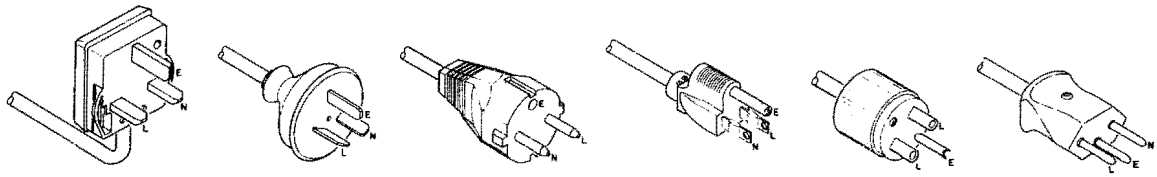
To change the line voltage requirements or replace a defective fuse, consult the Remote/250 Console Service Manual (HP part number 02645-90009). Only qualified technical personnel should perform these tasks.

Power Cords

Power cords for the Remote/250 console are available with connectors to match your particular needs. The cord packaged with the console depends upon where the console is to be delivered. If your equipment has the wrong power cord for your area, please contact your local Hewlett-Packard sales and service office.

Available Power Cords

Option	Rating	Ref. Specification	HP Part Number
900	250V/13A	BS 1363A	8120-1351
901	250V/10A	NZSS 198/AS C112	8120-1369
902	250V/10-16A	CEE7-VII	8120-1689
903	125V/10A	NEMA 5-15P	8120-1378
904	250V/6A	NEMA 6-15P	8120-0698
906	250V/6A	SEV 1011.1959-24507, Type 12	8120-2104



8120-1351 8120-1369 8120-1689 8120-1378[1] 8120-0698[2] 8120-2104

Power Cords

[1] UL and CSA approved for use in the United States of America and Canada with equipment set for either 100 or 120Vac operation.

[2] UL and CSA approved for use in the United States of America and Canada with equipment set for either 220 or 240Vac operation.

WARNING

IF IT IS NECESSARY TO RELACE THE POWER CORD, USE THE SAME TYPE BY ORDERING THE CORRECT HEWLETT-PACKARD PART NUMBER. FAILURE TO USE THE PROPER POWER CORD RESULTS IN AN ELECTRICAL SAFETY HAZARD. EQUIPMENT MAY ALSO BE SEVERELY DAMAGED EVEN IF A RELATIVELY MINOR INTERNAL FAILURE OCCURS.

Grounding Requirements

To protect operating personnel, the console chassis must be grounded. The Remote/250 console is equipped with a three-conductor power cable which, when connected to an appropriate power receptacle, grounds the chassis. To preserve this protection feature, do not operate the console from an ac power outlet that has no ground connection.

Cabling Information

Several connection types are available for use between the HP 250 and the Remote/250. The following table shows the cables required for the type connection you select.

Cabling Requirements

Device	Type Connection	Cable Requirements
HP 250	Modem[1]	•Use HP 45111A on HP 250 and use HP 13232N on Remote/250 in US. •Use HP 13232M on Remote/250 in EUR. •Use HP 13232A on Remote/250 in US/EUR.
	Direct	•Use HP 13232N on Remote/250 and connect directly to HP 250 port in US. •Use HP 13232M on Remote/250 and connect directly to HP 250 in EUR. •Use HP 13232A on Remote/250 in US/EUR and use optional HP 45113A for greater distance (up to 10.5 metres).
	Current Loop[2]	•Use HP 45112A on HP 250. and use HP 13232F on Remote/250.
Printer	HP-IB	•Use 4 metre HP-IB Cable and Load Box on Remote/250 and connect directly to printer[3]

[1] Use only limited distance (8-32 km) modems that meet Bell Spec 43401 at 9600 baud. Bell 103 or comparable type modes, and European 300 baud modems may be used. These modems, however, are not recommended for use because degradation in console performance occurs due to their slower baud-rate.

[2] A "twisted-pair" of 26 AWG wire, not supplied by Hewlett-Packard, can be used for current-loop connections up to 1 km.

[3] All components supplied with Option 044 (see Equipment Supplied on page 2-6) are required when using a printer with your console.

Duplex, Baud-rate and Parity Selection

The DUPLEX, BAUD RATE and PARITY switches define the communications method and rate that the Remote/250 uses when connected to other equipment. For normal operation, these switches are factory set to FULL DUPLEX, ODD PARITY, and 9600 BAUD.

NOTE

The DUPLEX and PARITY switches must always be set to their normal positions: DUPLEX: FULL; PARITY: ODD. Only the baud rate should be changed to meet the user's needs.

To change the Remote/250 console baud rate, perform the following steps.

1. Set the Remote/250 console power switch to OFF, and disconnect the power cord from the ac power outlet.

NOTE

The console keyboard overlay is unlocked by inserting the access key, supplied with the console, into the keyway located on the right side of the keyboard assembly. DO NOT ROTATE the key; insertion is sufficient to unlock to keyboard overlay.

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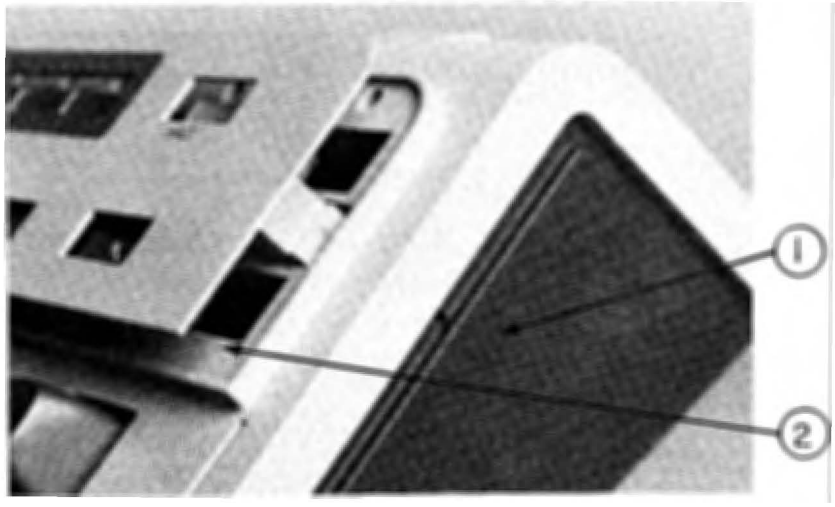
2. From the front of the keyboard assembly, insert the access key into the keyway located on the right side of the keyboard assembly until the keyboard overlay unlocks. See the next figure. Lift and remove the keyboard overlay.



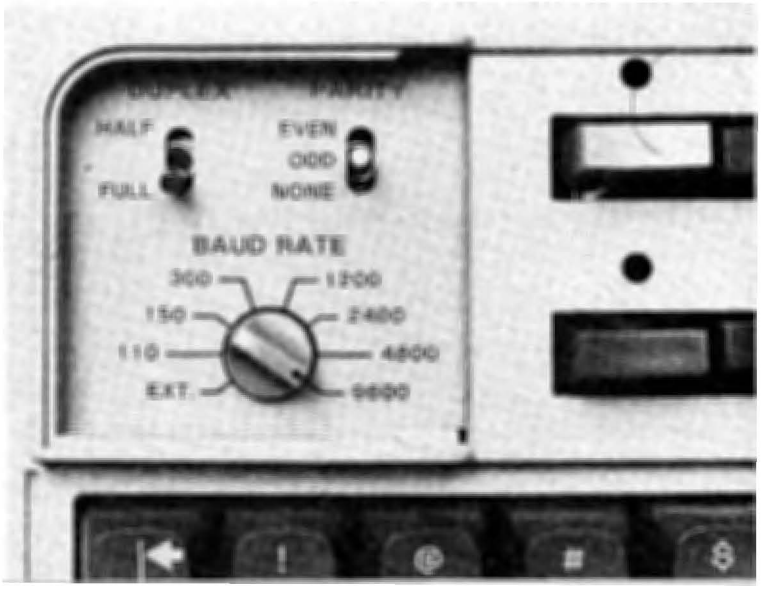
1. Insert key to release latch.
2. Remove overlay.

Removing the Keyboard Overlay

3. Set the BAUD RATE switch to the desired rate: 110, 150, 300, 1200, 2400, 4800, or 9600 baud. (standard is 9600 baud)

NOTE

The baud rate setting on the HP 250 asynchronous data comm board must match the baud rate selected for the Remote/250 console. See Chapter 1 for details.



Baud Rate Switch

4. Reinstall the keyboard overlay by placing the left side of the overlay into the slot on the left side of the keyboard. Snap the right side of the overlay onto the keyboard by pressing down firmly on the right side of the overlay.

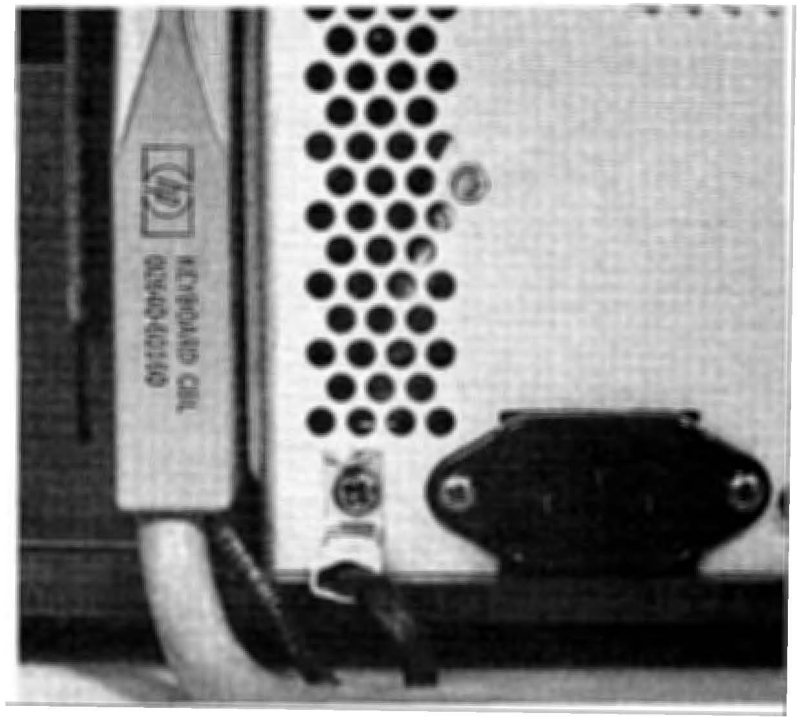
Console Installation

1. Place the Remote/250 on any convenient surface, except for a plush or spongy surface that might restrict air flow through the bottom vents.

CAUTION

Card connectors have been notch-keyed to prevent erroneous connection. Minimal pressure is needed to make the connection.

2. Raise the console's hinged rear-access cover (two rotating latches hold it in place) and connect the keyboard cable hood-connector to the printed circuit card connector that has been notched to match the cable connector. Connect the keyboard cable ground wire to the ground lug adjacent to the ac power receptacle.



Keyboard Cable Connection

NOTE

The HP 250 must have Option 120 or an HP 45120A Asynchronous Serial Interface installed in order to connect a Remote/250 console.

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3. Connect the proper interface cable hood connector to the communication interface. The card connector has been notched to match the hood-connector. Connect the other end of the interface cable to a modem or HP 250 interface port. See the Cable Requirements table on page 2-8.
4. Set the Remote/250 console power switch to the OFF position. Connect the power cord to the console power connector.

5. Ensure that the line voltage matches the Remote/250 requirements (either 115V or 230V, see the rear panel label). Plug the 3-prong power connector into a 3-prong power outlet.
6. Set the BAUD RATE switches on the HP 250 asynchronous interface board to match the Remote/250 console baud-rate selection (standard is 9600 baud). See Chapter 1.
7. Run the CONFIG program to reconfigure the memory configuration and Remote I/O configuration tables as required to support the Remote/250. Refer to Appendix C of the BASIC/250 Programming Manual.

Initial Power-Up

Switch the Remote/250 console on by rotating the ON/OFF switch to the ON position. The yellow light in the special function keyblock lights when power is on. When the console is connected to an HP 250 that is switched on and configured for a Remote/250 console, the console cursor appears.

Perform the General Self Test, Data Comm Self Test, and System Self Test to verify console operation.

Remote/250 Testing

General Self Test

The General Self Test completely checks the internal operation of the Remote/250 except for the asynchronous interface. The asynchronous interface is tested by the Data Comm Self Test.

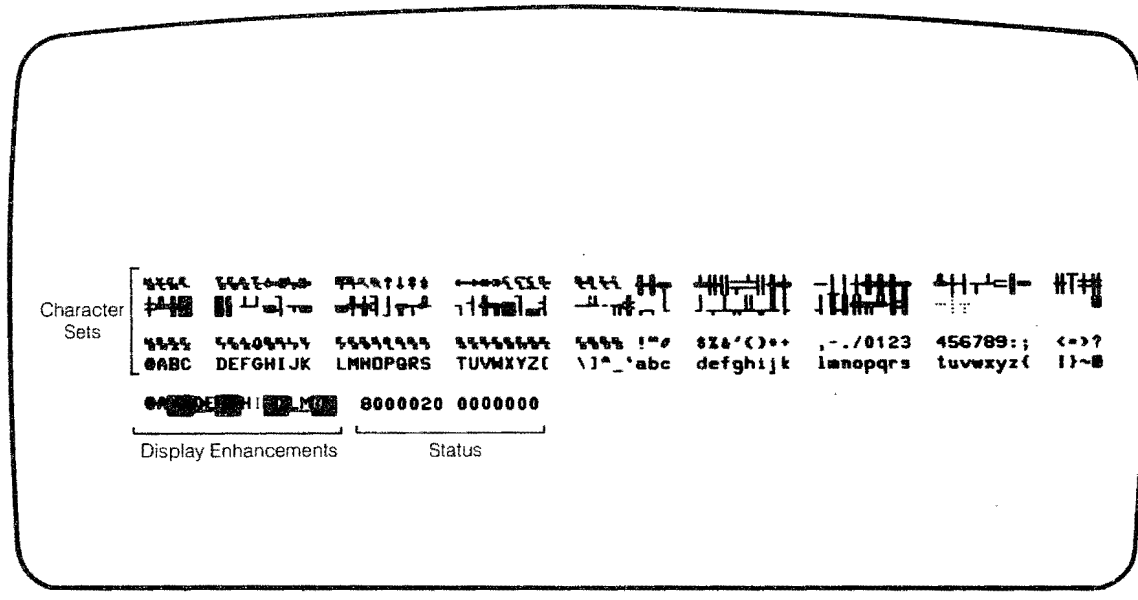
To initiate the General Self Test, switch the Remote/250 power ON and allow approximately 30 seconds for warm-up. Press the TEST key on the console keyboard and check for the following events:

1. The screen is cleared and any input or output operations that may have been in progress are stopped.
2. All keyboard lights (LEDs) blink on.
3. A beep indicates the following:
   - ROMs are properly installed and pass a checksum test.
   - Display memory passes its pattern test.
   - The HP-IB printer interface, if installed, passes its self-test.

NOTE

If an error occurs, an appropriate message is displayed. Press the RESUME key before attempting further operations.

4. All character sets are displayed on the console screen.
5. A display enhancement pattern is displayed on the console screen.
6. Status information is displayed on the console screen:



General Self-Test

Data Comm Self Test

The following procedure checks either the standard or extended asynchronous interface. To test RS 232C/V 24 operation, use the 02645-60002 Test Connector Assembly. To test 20 mA current-loop operation, use the 02645-60035 Test Connector Assembly.

NOTE

Never use a 02645-60003 test connector assembly to test the current-loop portion of the Extended Asynchronous Interface.

1. Switch the Remote/250 console OFF.
2. Remove the interface cable hood-connector from the asynchronous interface board.
3. Connect the test connector assembly (02645-60002 for direct connection or 02645-60035 for current loop connection) to the asynchronous interface board.
4. Switch the console ON and allow approximately 30 seconds for warm-up.
5. Press SHIFT-TEST. The appropriate message is displayed upon completion of the test. (If a failure occurs during the Data Comm Test, the RESUME key need not be pressed to continue.)
6. Switch console OFF. Remove the test connector assembly and re-install the interface cable hood-connector.

System Self Test

The HP 250 System Self Test is initiated at power-up, and consists of steps 1 through 3 of the General Self Test. Perform the following procedures to conduct the System Self Test.

1. Switch the Remote/250 ON and allow approximately 30 seconds for warm-up.
2. Install an operating system disc configured to support the Remote/250 into a disc drive.
3. Load the operating system by switching the HP 250 off and on again.
4. Check that steps 1 through 3 of the General Self Test are accomplished.

Extended Tests

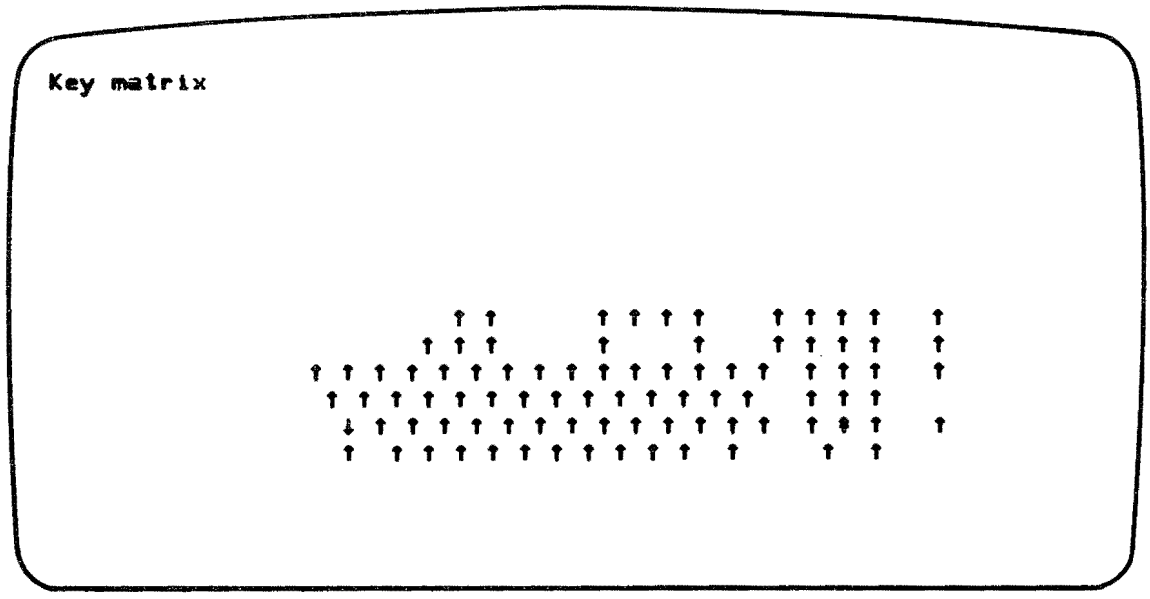
The Remote/250 console has no offline capabilities as with HP 2640-series terminals. Because of this, extended tests are available which allow testing the keyboard switches and LEDs. To access the extended tests, press CTRL-RESUME.
When `Enter extended test no. (1-4)` appears on the display, type the number of the desired test, or press the space-bar or RESUME key to exit the test and return to normal operation. Once any of the Extended Test routines are entered, press the space-bar to terminate the particular test and return to the Extended Tests menu. Press the RESUME key to terminate the Extended Tests and return to normal operation.

TEST 1, Repeat Test

This test repeats the General Self-Test and Data Comm Self-Test until either an error is detected or the test is terminated. Pressing the space-bar stops the test and returns you to the Extended Tests menu.

TEST 2, Keyboard Matrix Test

The Keyboard Matrix Test checks each key for proper operation. When the test is selected, Key matrix is displayed in the upper left-hand corner of the screen. A 40-column by 6-row display represents key positions on the console keyboard. A vertical arrow represents the position of each key except RESUME. When a key is pressed, the corresponding arrow changes from an up-arrow to a down-arrow. When the key is released, the arrow changes to a DOUBLE HEADED up-arrow. Pressing the key again changes the arrow to a DOUBLE HEADED down-arrow.



Keyboard Matrix Test

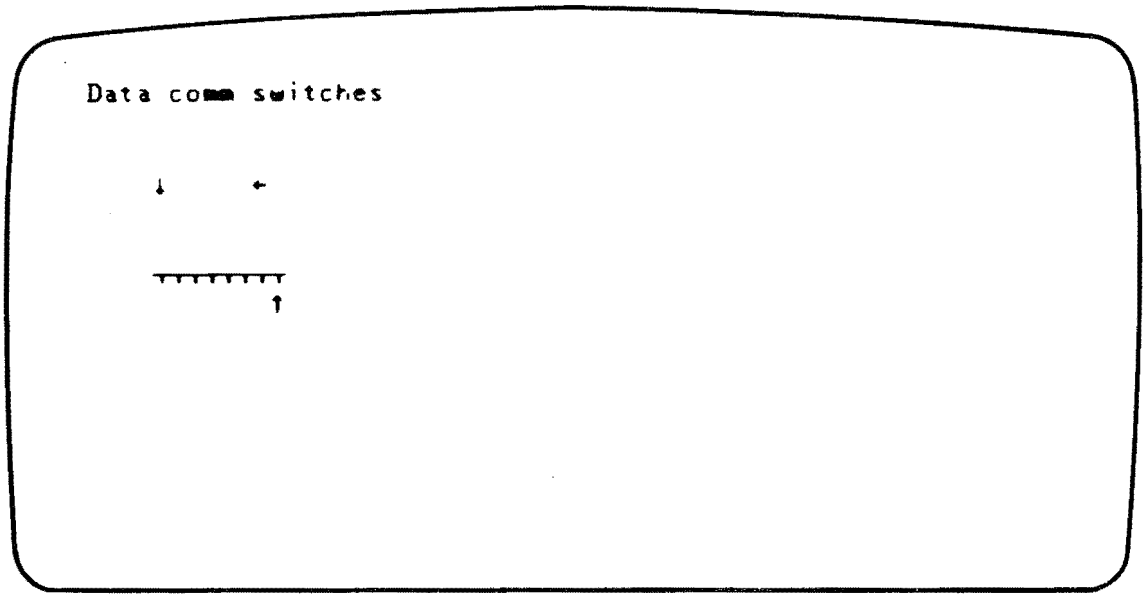
If a key is pressed and the processor does not recognize the key code, a character in the lower-right corner of the screen quickly identifies malfunctioning keys or groups of keys.

Pressing the space-bar stops the test and returns you to the Extended Tests menu.

TEST 3, Data Comm Switch Test

The Data Comm Switch Test checks the operation of the BAUD RATE, PARITY, and DUPLEX switches. To gain access to these switches, see Duplex, Baud Rate, and Parity Selection on page 2-8.

When the test is selected, Keyboard switches is displayed above a graphic representation of the actual switch settings.



Data Comm Switch Test

This display is continuously updated as the DUPLEX, BAUD RATE, and PARITY switches are changed.

NOTE

If the DUPLEX switch is left in the HALF position, or the BAUD RATE switch is left in the EXT position when the Data Comm Switch Test is terminated, IMPROPER SETTINGS is displayed until both switches are correctly set.

Pressing the space-bar stops the test and returns you to the Extended Tests menu.

TEST 4, Keyboard LEDs Test

The Keyboard LEDs Test checks each LED (light) on the keyboard. When the test is selected, Keyboard LED's is displayed and all the LEDs on the keyboard are turned off. To test each LED, press the keyswitch directly below the LED.

Pressing the space-bar stops the test and returns you to the Extended Tests menu.

Accessory Installation

Two accessories may be added to the Remote/250 console: a Printer Interface which allows the console to support an HP 2631A or HP 9871A Printer, and an extended asynchronous Interface which expands the data communications capabilities to include 20 mA current loop and modem disconnect. This section gives procedures for installing these accessories. If you have any questions or concerns regarding the installation of either accessory, call your local Hewlett-Packard sales and service office for assistance.

WARNING

BECAUSE ELECTRICAL COMPONENTS ARE EXPOSED DURING THE INSTALLATION OF ACCESSORIES, ONLY QUALIFIED PERSONNEL SHOULD PERFORM THE INSTALLATION PROCEDURES. FAILURE TO DISCONNECT POWER PRODUCES AN ELECTRICAL HAZARD.

NOTE

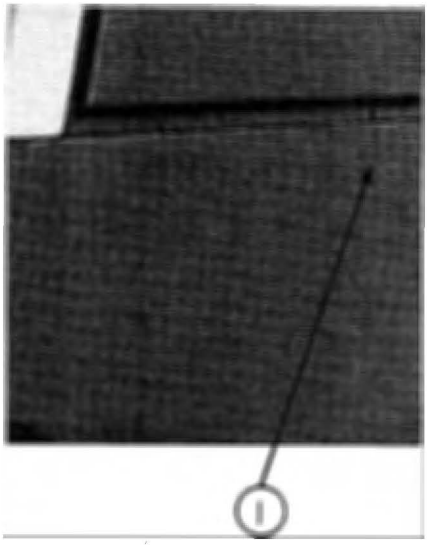
Many of the circuit boards have strapping switches which are factory-set and should not be changed. For more information, see Circuit Board Strapping and Jumpers on page 2-24.

Opening the Console

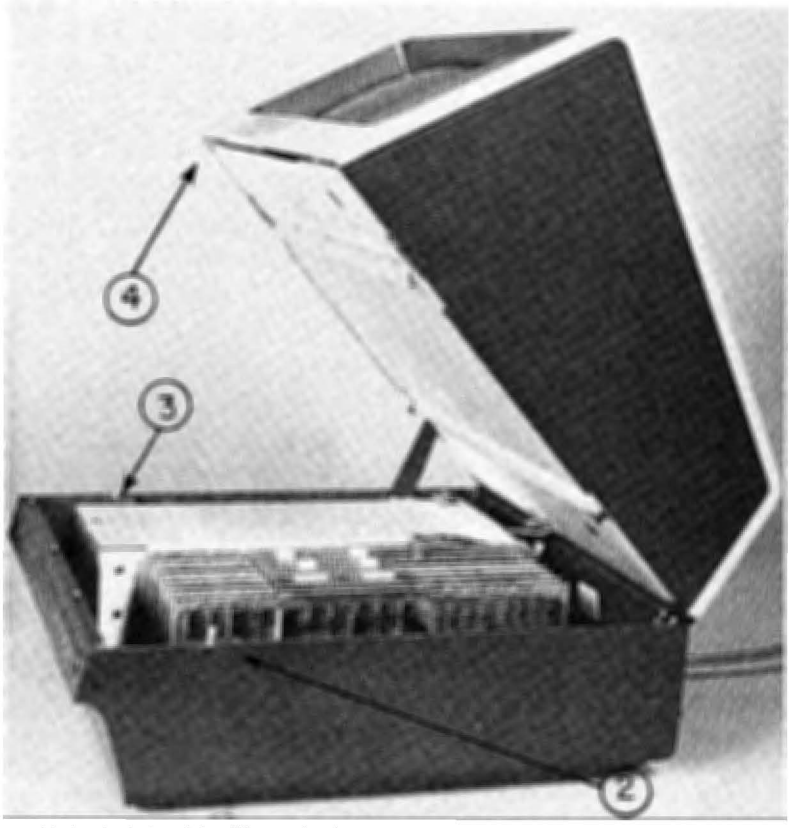
To gain access to the console internal components, open the console as follows.

1. Set the Remote/250 console power switch to OFF, and disconnect the power cord from the ac power outlet.
2. From the front of the console, insert the access key into the right keyway and unlock the right side of the console by slightly raising the right side top cover. (DO NOT ROTATE THE KEY.) See the next figure.
3. While maintaining upward pressure to keep the right side unlocked, insert the access key into the left keyway and raise the top cover until both the right and left sides of the console are unlocked.

4. Using both hands, carefully swing the top cover up until it latches into the half-open position.



1. Insert access key into keyway.



2. Unlock right side of terminal.
3. Keeping **Constant upward pressure**, unlock left side of terminal.
4. Latch cover into half-open position.

Opening the Console

Extended Asynchronous Interface Installation

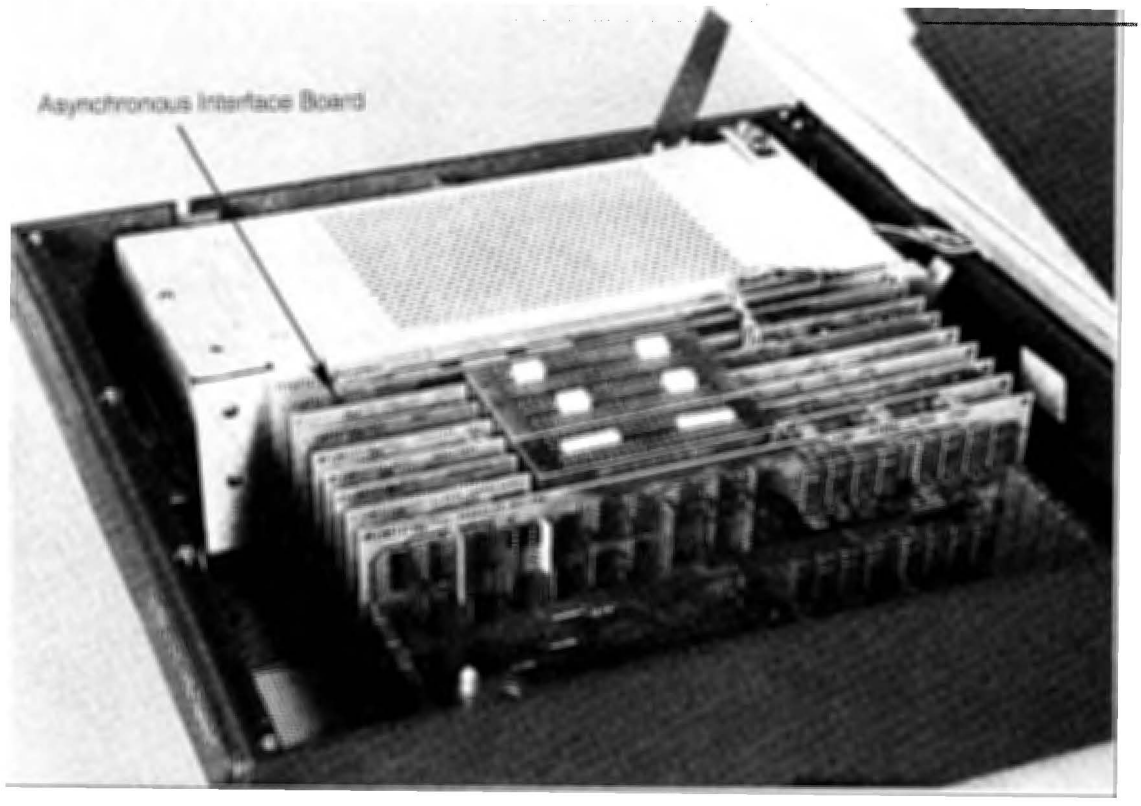
The following equipment must be ordered to upgrade your Remote/250 console to include Option 050.

- HP 13250B Extended Asynchronous Interface.
- HP 13232F 20mA Current Loop Cable Assembly.

Perform the following steps to install the extended asynchronous interface accessory.

1. Set the Remote/250 console power switch to OFF and disconnect the power cord from the ac power outlet.

2. Open the console top. See Opening the Console on the previous page.
3. Locate the standard asynchronous interface board (02640-60086).



Circuit Board Identification

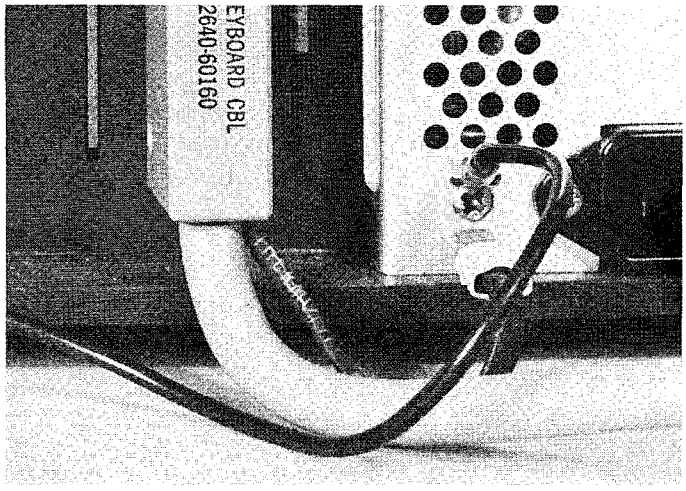
4. Remove the modem cable from the interface board and remove the board from the backplane connector by lifting up on the front of the circuit board.

Circuit Board Removal

NOTE

Many of the circuit boards have strapping switches on them which are factory-set and should not be changed. For more information, see Circuit Board Strapping and Jumpers on page 2-24.

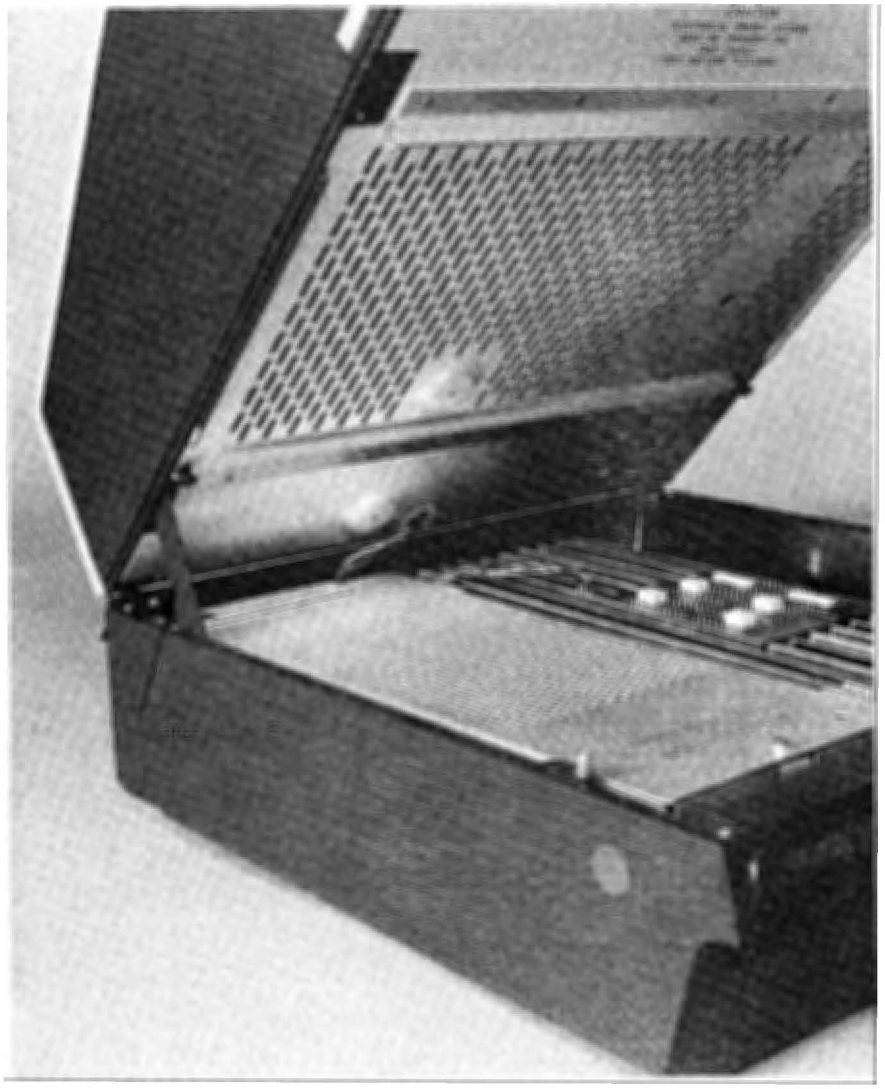
5. Install the extended asynchronous interface board into the same location from which the standard board was removed. Ensure the board is completely seated into the backplane by firmly pressing down along the top edge of the board.
6. Remove the screw securing the grounding-lug connectors adjacent to the ac power receptable and connect the extended asynchronous interface board ground wire to the console by reinstalling the grounding-lugs and screw. Route the ground wire behind the back cover panel and connect the ground plug to the interface ground receptacle.



Extended Interface Grounding

7. Install the hood-connector of the current loop cable, HP 13232F, to the extended asynchronous interface board. The hood connector is notched-keyed to match the board. Minimal pressure is needed to make the connection.

8. Firmly grasp the console top cover in one hand and release the safety latch by pressing it inward with your other hand. Using both hands, carefully lower the top cover to its closed position.



CAUTION

Support Top While Releasing Safety Latch

Closing the Console Top Cover

9. Connect ac power to the console and perform the Data Comm Self Test on page 2-13.

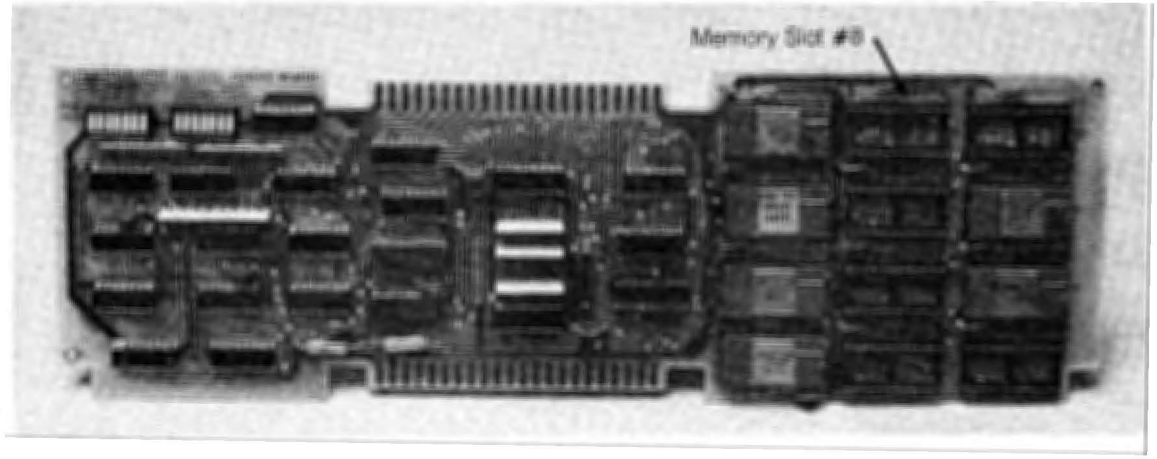
Printer Interface Installation

The following equipment must be ordered to upgrade your Remote/250 Console to include Option 044.

- HP 13296A HP-IB Printer Interface Board
- HP-IB Printer Cable, 8120-1834
- Printer Support ROM, 1818-0768
- Load Box, 02640-60215
- IC Extractor, 8710-0585

Perform the following procedure to install the printer interface.

1. Set the Remote/250 console power switch to OFF and disconnect the power cord from the ac power outlet.
2. Open the console top. See Opening the Console on page 2-17.
3. Locate the control memory board (02640-60192) and remove the top plane assembly by pressing down on the connector removal handle.
4. Remove the control memory board from the backplane connector by lifting up on the front of the circuit board.
5. Carefully insert the Printer Support ROM into blank socket #8 of the control memory board. Ensure that the ROM is oriented with the small notch on the top edge pointing in the same direction as the notch in other components near the Printer Support ROM.



Printer Support ROM Installation

6. Re-install the control memory board into the backplane assembly connector from which it was removed. Ensure the board is completely seated into the backplane by firmly pressing down along the top edge of the board.
7. Re-install the top plane assembly. Ensure that it is fully seated onto the circuit boards by rocking it from side to side as the assembly connects to the circuit boards.
8. Install the HP-IB printer interface board into an empty backplane slot adjacent to the other circuit boards in the console. Ensure the board is completely seated into the backplane by firmly pressing down along the top edge of the board.
9. Use the IC extractor to remove each IC load from its storage position in the load box and reinstall the IC loads into their corresponding socket below the storage socket. Ensure that an even upward pull with the IC extractor is used when removing the IC loads. Slight rocking of the IC loads may be required.Ensure that the dot on the top of the IC load is adjacent to the "1" printed on the circuit board when installing the IC loads. Connect the load box to the back connector of the printer interface board. Minimal pressure is needed to make the connection. Connect the load box ground wire to the ground lug adjacent to the ac power receptacle.

Load Box Installation

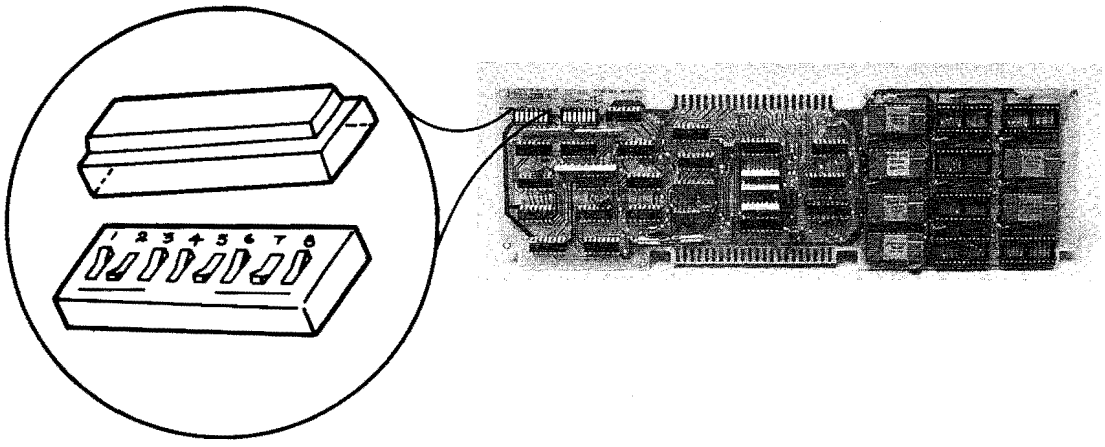
10. Install the HP-IB printer cable (4 metres) to the printer interface load box.
11. Firmly grasp the console top cover in one hand and release the safety latch by pressing it inward with your other hand. Using both hands, carefully lower the top cover to its closed position.
12. Connect the HP-IB connector end of the printer cable to either an HP 2631A or HP 9871A printer.
13. Connect ac power to the console and perform the General Self-Test.

NOTE

The printer can be set to any HP-IB address from 0 thru 5 or 7.

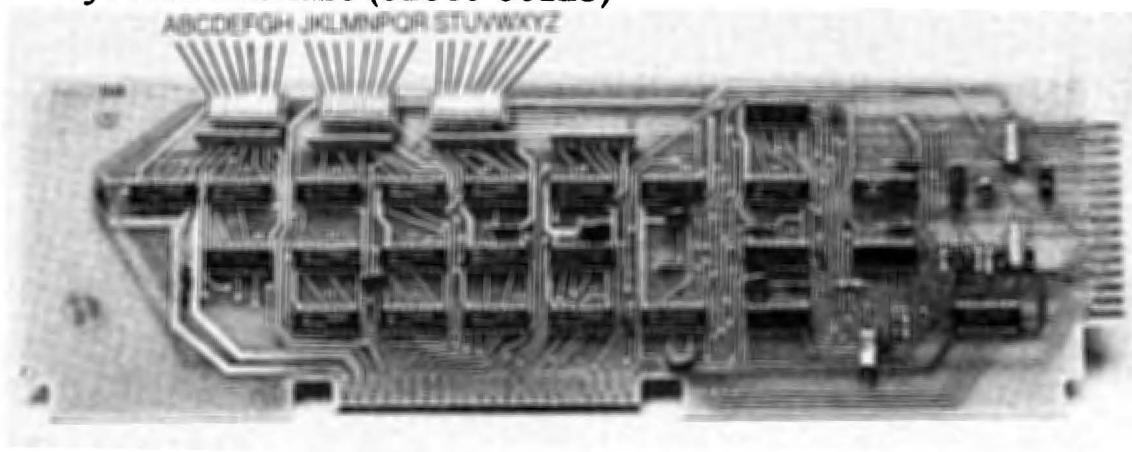
Circuit Board Strapping and Jumpers

The circuit board strapping switches are factory-set, as described here, and should not normally require repositioning. If additional information is required, see the HP 2645A Reference Manual (02645-90005) and the HP 2645A Service Manual Supplement (02645-90009).



Typical Strapping Option Switch Assembly

Keyboard Interface (02640-60123)



Keyboard Interface Strapping

Straps	A-H	J-N	P-V	W	X	Y	Z
Setting	closed	closed	closed	closed[1]	closed	open[2,3]	closed

[1] When switch W is open, the Data Comm Self-Test is disabled.

[2] When switch Y is open, the modem light is turned on when a Data Set Ready signal is received from a modem by the extended asynchronous interface. When switch Y is closed, the modem light is turned on when the Clear To Send signal is received from the modem.

[3] When switch Y is open, pressing the console MODEM key causes the Remote/250 to disconnect from a modem if an extended asynchronous interface board is used in the console.

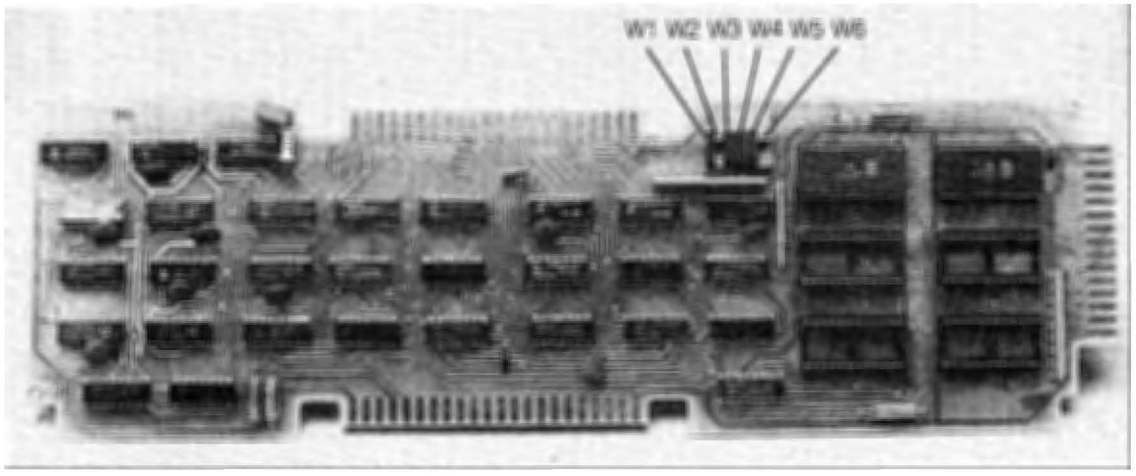
Extended Asynchronous Interface (02640-60089)

Straps	A9	A10	A11	CBE	all others
Setting	closed	closed	closed	closed	open

HP-IB Printer Interface (02640-60128)

Straps	A4	A11	A10	A9	ATN	ATN2	PL6	PL5-PL0	FC	TA	LA	B4-B0	SC
Setting	closed	open	closed	closed	open	closed	closed	open	closed	closed	closed	closed	open

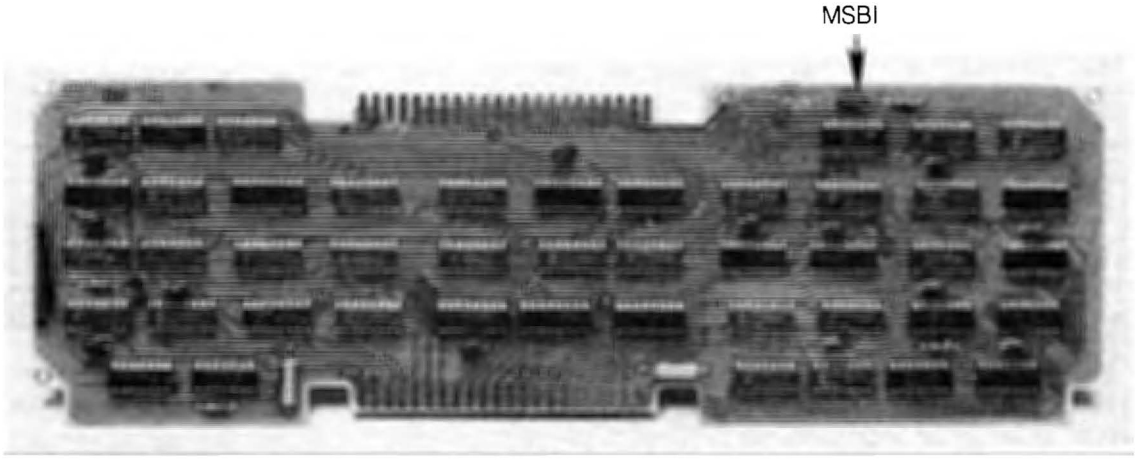
Display Enhancement Board (02640-60024)



Display Enhancement Board

Jumper	W1	W2	W3-W6
Setting	closed	open	closed

Display Memory Access Board (02640-60124)



Display Memory Access

Jumper	MSBI
Setting	closed

NOTE

There must be no open backplane slots between the power supply and the display memory access board, and no open slots between the Processor and the display memory access board.

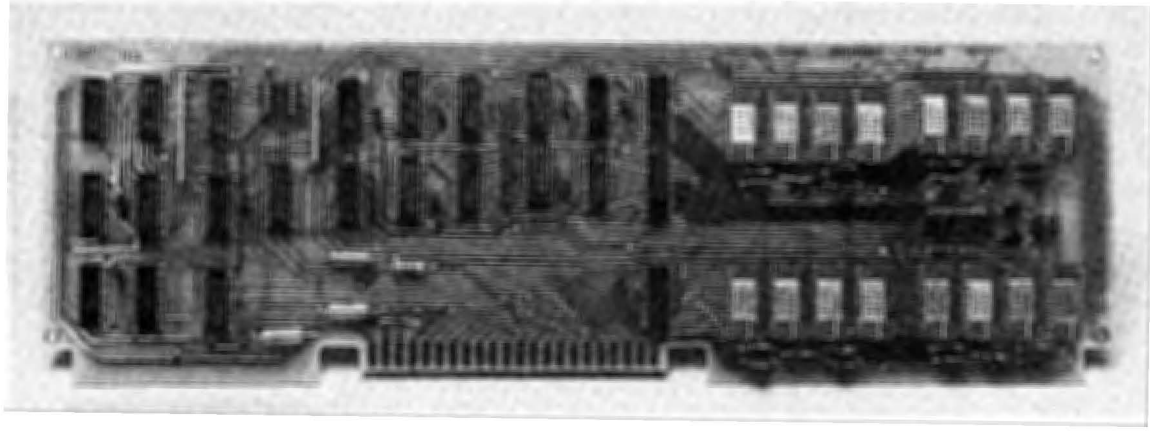
Display Control Board (02640-60112)

There is only one jumper on this board; it must always be closed for the Remote/250.

Processor Board (02640-60209)

Jumper	CLR	all others
Setting	open	closed

8K Display RAM Board (02640-60101)



Display RAM Board

Jumper	8K	16K	32K
Setting	open	open	open

Asynchronous Data Comm Self-test Errors

Message	Level	Description	Corrective Action(s)
ASYNC DATA COMM. BOARD ON PA x IS CONFIGURED BUT NOT THERE.	W	1. A remote device is configured and no Async board is present. 2. Jumper 7 on Async board in B position. 3. Async board failure-status line not on.	Verify that peripheral address switch on the Async board is set to PA 5. Verify that Async board is present and seated properly in mother board. Verify that all jumpers on Async board are in "A" position (not to be confused with jumpers on RS232C Connector Board). Jumpers on Async board are factory set and must not be changed.
SYSTEM LOAD FAILURE– INT ERR ON PA 5.	C	Async board unable to clear data comm. interrupt.	Replace the Async board.
ASYNC DATA COMM. BOARD ON PA x IS DOWN.	F	1. Async board failed a test of one of the board's functions common to all ports. 2. All ports failed self-test (see below).	Replace Async board.
PORT x IS DOWN.	F	Async board failed one of port dependent tests (i.e., UART, RS232C, etc.).	Replace Async board.
CONSOLE ON PORT x IS DOWN.	W	REMOTE/250 console (2649D) positively failed its self-test.	Replace or repair REMOTE/250.
DEVICE ON PORT x IS DISCONNECTED OR TURNED OFF. (Unless the RS232 receiver is bad, this message will be displayed only if jumper #9 is in the "B" position indicating that the Async board is to monitor the data terminal ready for modem signal from the REMOTE device.)	W	1. Hardwired or limited distance modem (leased service): Jumper #9[1] is in "B" position and data terminal ready is not provided by REMOTE device. 2. Switched service modem: As long as jumper #9[1] is in "B" position this message will always appear for switched network modem.	1. Verify that REMOTE device is powered up. 2. Check cable(s). 3. Verify that REMOTE device is designed to provide DTR. 4. Replace Async board. 5. REMOTE device failure (i.e., not providing DTR). 6. In general, any reason DTR is not provided to HP 250. 7. If using switched-service modems, power-up system, establish data comm. connection and check the operation of the REMOTE device.

NO RESPONSE TO SYSTEM SELFTEST	W	No response or invalid response from self-test of REMOTE/250 console (2649D). If jumper #9 is in the "A" position, the data comm. connection must exist and the 2649D must be powered up. Otherwise, this self-test always fails. It's recommended that jumper #9 remain in the "B" position for RS-232 REMOTE connections.	1. Check that 2649D is powered up. 2. Check cables. 3. Check parity, baud rate and duplex settings on 2649D. Must be full duplex, odd parity. Baud rate must be consistent with Baud rate setting on HP 250 Async board. 4. Transmission error: retry power up. 5. Port x on Async board is bad: replace Async board. 6. 2649D failure: run local self-tests; then repair or replace.
PORTS DOWN; TIO DROM NOT LOADED.	F	Async board is present but TIO DROM is not loaded.	Run "config" program and specify TIO or RIO DROM to be auto loaded. (See BASIC/250 Programming manual for details on running the CONFIG program.)

Error Levels

Level	Description
W	Warning message. An error condition exists which should be rectified, and which may result in unpredictable results if not corrected.
F	Fatal error. The port(s) or entire ADCB will not be accessible due to self-test failures.
C	Catastrophic error. Will cause system load failure.

1 On back of RS 232C connector panel.

In Case of Trouble

If you encounter a problem while installing a Remote/250 console, locate the problem in the following list and perform the required action. Contact your local Hewlett-Packard sales and service office for further assistance.

Problem	Action
Self-Test(s) Fail	• Repeat self-test that failed. • If circuit boards were moved or added, check the affected board strapping.
Console Completely Dead	• Cycle the ON/OFF switch. • Unplug the power cord and try it in a different ac outlet.
Display Not Steady	• Check that the voltage and frequency of the ac outlet matches the Remote/250 console requirements.
Printer Fails to Work After Installation	• Repeat all installation procedures. • Check the HP-IB printer interface strapping.
Extended Asynchronous Interface Fails to Work After Installation.	• Repeat all installation procedures. • Check the extended asynchronous interface strapping.

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Tel: 45 78 87
Telex: 011-4093
Cable: FROSTBLUE

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Telex: 011-3751
Cable: BLUESTAR

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